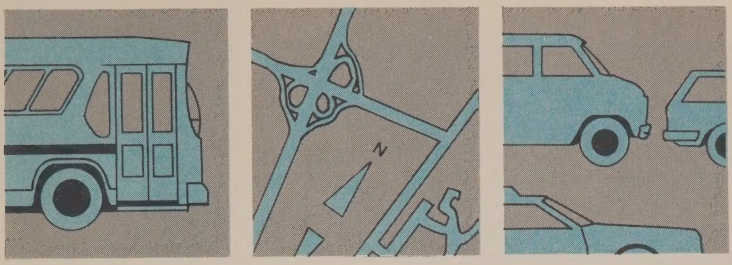
Energy Conservation through Transit and Ridesharing

An Overview of Municipal Opportunities



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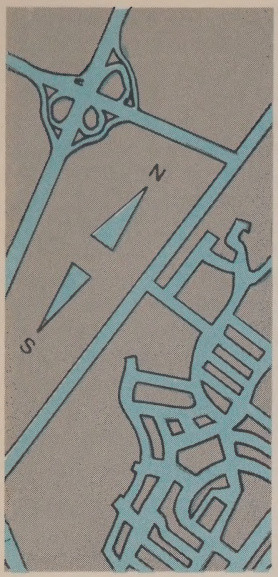


Efficient Transportation

Using existing resources as efficiently as possible makes great sense in today's world — particularly in a municipal setting, where budgets seldom keep up with inflation. In this environment, the major challenge for transportation planners is to accommodate an increasing travel demand by using the existing road system more efficiently. One logical way to accomplish this goal is by encouraging commuters to shift to higher-occupancy vehicles, thereby moving more people with the same number of vehicles. This action can range from getting neighbours to share the ride to work to implementing transit improvements that raise the level of ridership.

A significant shift to these energy-efficient modes of transportation enables a municipality to postpone or even avoid capital-intensive roadway improvements. Commuters also save energy dollars when they leave their car at home, thereby possibly avoiding the cost of a second car. Commuters using ridesharing have reported dollar savings of between $300 and $1300 per year and fuel savings of up to 75 per cent.

Enticing commuters away from their lone drive to work, once thought to be a hopeless dream, is now becoming a science. A growing number of Ontario municipalities and companies are showing what can be accomplished when innovative transit improvements and ridesharing programs are carefully implemented. For example:

- A computerized transit-information system contributed to increased ridership of 10-13 per cent in Mississauga during its first year of use.
- When Oakville commuters were given free use of local transit to take them to GO Train stations (an instance of fare reduction), transit use grew by 34 per cent (100 000 people) in nine months.
- By introducing express and limited-stop bus service on selected routes, Ottawa-Carleton has improved its average transit system-speed by 33 per cent, resulting in a significant increase in hourly transit capacity with minimal capital investment.
- Bell Canada saved $55 000 in parking-lot improvements after introducing a vanpool program.
- When Westinghouse Canada relocated a plant sixty kilometres away, many employees were able to use vanpools rather than move their homes.
- At Chrysler Canada absenteeism and tardiness have been cut by two-thirds among vanpoolers.

The Municipal Role

Ontario municipalities have a key role to play in the area of transportation. The challenge in public transit is to infuse new ideas into present systems and to discover which of the new techniques and technologies best apply to local conditions. The task in ridesharing, a new field for municipal involvement, is to set up systems that facilitate the implementation of carpools, vanpools, and the various forms of paratransit.

Ridesharing concepts are simple and flexible. Their use can make sense where a large transit vehicle or single-occupancy vehicle does not. Carpooling makes use of privately owned automobiles, with a designated driver or a rotation of drivers. Vanpooling extends the carpool concept and involves the use of a 12-passenger van, which can be owned and operated by private individuals, groups, or companies. Paratransit services include all forms of urban transportation available to the public other than public transit — such as taxis, dial-a-ride, and short-term car rentals.

The greatest need in ridesharing is for coordination. Individuals who want to ride together need to be matched up. Employers who want to promote ridesharing in their companies need implementation advice and assistance. With the help of the Ontario Government, municipalities can supply the elements that individuals and companies need to make ridesharing a reality.

Leadership in introducing transportation innovations will usually come from municipal transportation planning departments or from the transit operator. However, the vitality and long-range success of any municipal effort to conserve energy and money relies on the support given to it by senior administrators and elected officials. Their overall management perspective and ability to gauge and marshal public support are essential ingredients in a consistent and effective transportation program.

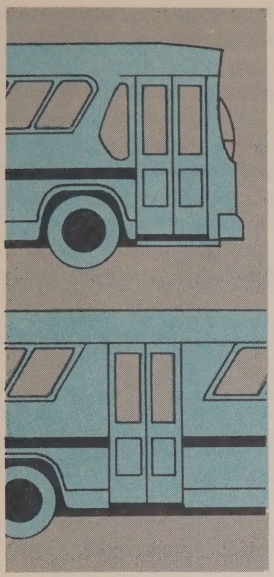
This booklet outlines some of the specific measures that municipalities can put into effect in the transit and ridesharing areas to help meet current and future transportation needs while saving energy and dollars.

Energy Requirements of Various Travel Modes

Mode	Number of Passengers	Energy Intensity* (MJ/person-km)
Automobile	driver only	7.75
Carpool	5	1.55
Vanpool	12	0.75
Commuter rail	160 (320 crush)	0.66 (0.33)
Diesel urban bus	40 (100 crush)	0.54 (0.22)
Streetcar	52 (130 crush)	0.43 (0.17)
Subway	76 (320 crush)	0.42 (0.10)
Trolley coach	40 (100 crush)	0.26 (0.11)

Source: Metropolitan Toronto, 1981

**Includes direct and indirect energy consumption.*



Improving Transit

Ontario has some of the best and most progressive municipal transit systems to be found anywhere. Ottawa-Carleton has attained the highest per capita ridership of any North American bus-only system, and Metropolitan Toronto has received international recognition for the quality of its subway and surface transit. Many of the ways suggested in this booklet to improve transit services and reduce energy consumption have been tried in these and other Ontario municipalities.

The process used to upgrade transit service can sometimes be as important as the improvement itself. Involving transit riders and community organizations in the process can not only yield valuable perspectives and ideas, but can also help build a loyal ridership and a supportive public.

Some transit-improvement measures that will have immediate appeal to prospective riders are given below. These are followed by a number of additional measures that municipalities can implement to cut costs and save energy.

Each municipality must determine for itself, of course, which of these measures will provide the best answers to the needs of local riders and still fall within municipal budgetary constraints.

Attracting Riders

Proven measures which transit operators can take to attract new riders include the following:

- *Restructure transit services* to minimize transfers, consolidate transfer opportunities, add bus ramps to freeways, and provide limited-stop direct service between points whenever potential demand exists.

- *Reduce travel time by improving the flow of transit vehicles*. A variety of approaches can be used here — "transit-only" streets and reserved transit lanes, express bus service with commuter park-and-ride facilities, monthly passes and prepaid boarding areas, reductions in the number of stops, and traffic-flow improvements.

- *Improve routes and schedules*. Transit stops can be located for greater rider convenience. Schedules can be examined regularly. Computer packages have been developed to help in this process.

- *Reduce the time that passengers wait*. A computerized transit-information system has been developed that allows a rider to find out by telephone when a bus will arrive at a particular stop. Applications in Ottawa and Mississauga have proven successful.

- *Provide transit marketing*. Transit marketing is an organized and comprehensive program. It includes: market research to identify prospective riders and their needs and preferences; service planning to determine routes, schedules, and fares; promotion to increase awareness and maintain a high profile for the transit image; and customer services to provide maps (including schedules and location of stops) and telephone information for riders.

Raising Efficiency

Increasing the energy efficiency of transit operations can result in significant cost savings. Some of the best payback options include:

- *Use the best size and type of vehicle for the job*. Small buses, high-capacity buses (articulated), and shared-ride taxis are all alternatives to buses of conventional size.

- *Improve the maintenance and operation of vehicles*. This can be done by maintaining constant operating speeds, performing regular maintenance checks, and promoting good driving habits.

- *Improve energy use in storage and maintenance facilities*. Facilities should be located so that vehicles travel the shortest distances possible without passengers ("deadheading"). Consideration should be given to energy-efficient construction features, the use of solar heating, the modification of conventional heating systems to provide energy savings, and the regulation of light and heat in off-peak periods. Another possibility is conversion from oil heat to natural gas or electrical heat.

- *Use alternative fuels*. Propane can be used in light and medium-weight gasoline-powered buses and vans. Diesel fuel is most appropriate for heavier vehicles. The Town of Pickering converted over half its fleet of 22-passenger Thomas Mighty Mite buses to propane in 1981. On each bus they have saved $2,925 per year on fuel and maintenance costs compared to their gasoline-powered models.

- *Use electrified transit*. Trolley buses are a proven technology in use in Toronto and Hamilton.

Planning Ahead

Land use is a key to transportation demand and therefore to the energy used by transportation systems. Where home and work places are built side by side, the need for transportation is reduced. Subdivisions can be designed with transit service in mind by having direct transit routes through the area, thus minimizing the walking distance to bus stops. Also, municipalities can

encourage the development of higher-density residential areas where transit services can be made more efficient and more attractive to riders.

Some of the other approaches that can be used in urban areas with a view to future energy savings are mixed-use buildings (office, shopping, residential), multi-family housing complexes, and concentrations of development along existing major traffic corridors and at suburban centres.

Ottawa-Carleton's Recipe for Success

Success = *an efficient, high-quality transit service and dramatically higher transit ridership in new growth areas*

1. Provide a high level of transit service from the initial stages to final development.

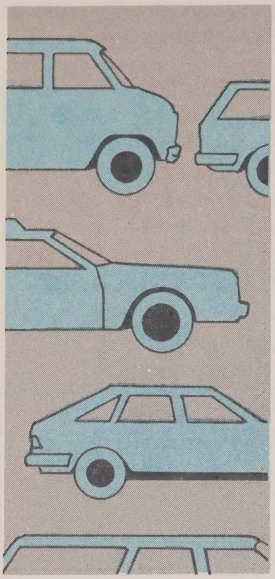
2. Minimize overall walking distances to bus stops through:

   - appropriate location of the collector roadway system to be used by transit
   - provision of paved connecting walkways
   - placement of all high-density developments on the streets serviced by transit
   - placement of all medium-density developments on streets carrying transit or at least closer to transit than low-density development

3. Where possible, concentrate as many transit routes as possible on the same street. This will keep the time between buses, or "headway", to a minimum.

4. Link a sufficient number of neighbourhoods by one service to ensure that attractive headways can be efficiently provided during both peak and off-peak periods.

5. Work at developing a transit route structure that will minimize the need for future routing changes.



Ridesharing

A Flexible Alternative

Ever since the energy shock waves of 1973, ridesharing has been coming into its own. While people had been sharing the ride to work long before that, only over the last decade have more organized ridesharing programs shown what this concept can accomplish in terms of energy and monetary savings.

Basically, a ridesharing program attempts to raise occupancy levels in a whole range of public and private vehicles. Since it generally uses vehicles much smaller than standard-size transit buses, it can be particularly more flexible and cost-effective than regular transit in servicing outlying areas with low population densities. In fact, when carefully implemented, ridesharing complements regular transit very effectively.

Because of these potential benefits to the municipality and given its transportation mandate, ridesharing options — carpooling, vanpooling, and paratransit — merit the support and active promotion of Ontario municipalities. With minimum staff time and costs, municipalities can play a valuable coordination role in implementing ridesharing programs.

Carpools and vanpools are very flexible and can be used for a wide variety of functions — trips to work, school, and sporting events, recreational excursions, and shopping expeditions. The Provincial **Share-A-Ride** program offers significant support to municipalities and organizations interested in starting carpool or vanpool programs. The Ontario Vanpool Organization (OVPO) has been instituted specifically to help municipalities, employers, and other groups to organize and operate vanpools.

Paratransit services offer valuable transportation options as well. The term paratransit includes any vehicle the public has access to, other than scheduled buses. Such things as short-term rental cars, taxis, jitneys, vans, dial-a-ride services, and subscription bus services fit into this category. Subscription buses, also called bus-pools (where commuters sign up and pay in advance), can provide long-distance service from areas lacking adequate public transit, when a large number of people need to get to a single major employment location. The other paratransit options provide potential energy and cost savings in small communities and in urban fringes during off-peak times, especially on weekends. It is also more economical to use paratransit for the handicapped than to adapt regular transit vehicles.

Commuting Costs

Vanpooling vs. Driving Alone

Daily Round Trip	Weekly Cost of Driving Alone*	Typical Weekly Vanpool Fare**
20 km	$ 9.75	$12.50
40 km	19.50	13.80
60 km	29.25	15.20
80 km	39.00	16.60
100 km	48.75	17.90
120 km	58.50	19.30
160 km	78.00	22.00

**Includes only gas and maintenance costs of operating a standard size car.*

***Based on 10 paying passengers; includes capital and operating costs.*

A Municipal Agenda

Municipalities interested in taking advantage of the benefits of ridesharing can undertake the following measures:

- *Appoint a ridesharing coordinator.* This person can act as a focus for ridesharing efforts in the municipality and provide a central contact for collecting and giving out information. The duties of the coordinator can include dealing with large employers, providing matching services for groups and individuals, setting up promotional and marketing programs, and seeking out new markets.

- *Investigate the ridesharing market in the municipality.* By contacting **Share-A-Ride**, the Ontario Government program, municipalities can find out where ridesharing programs already exist and how they are working. To determine where new ones might be developed, municipalities can arrange for surveys of employers and householders. Studies that give details of travel patterns and other pertinent information can be provided by the Transportation Energy Management Program (T.E.M.P.) of the Ontario Ministry of Transportation and Communications.

- *Develop a ridesharing program for municipal employees.* Municipalities can take the lead in making the idea of ridesharing visible and gain invaluable experience by starting a program among their employees. (Some employers have found ridesharing can cut absenteeism and tardiness by as much as two-thirds.) Existing staff can administer the program, and incentives such as preferential parking and flexible hours for participants can be used to get it going.

- *Develop and support employer ridesharing program.* Using the expertise gained in their own programs and the support material available from the Government of Ontaio's **Share-A-Ride** program, municipalities can go directly to large businesses and help them start ridesharing programs. Many Canadian companies already sponsor ridesharing —

3M Canada, Garrett Manufacturing, Dofasco, Chrysler Canada, and Bell Canada, among others. These companies report better morale, decreased parking needs, reduced absenteeism and lateness, and positive publicity in the media.

- *Develop third-party vanpooling programs*. Where a single business is too small to sponsor vanpooling, or where it lacks the immediate motivation to do so, municipalities can step in and facilitate vanpooling by a third party. This party can be another employer, the municipality itself, the Ontario Vanpool Organization, or a charter operator.

- *Promote and support area-wide carpooling*. Most people in Ontario still drive to work alone. Municipalities can encourage many of these people to share driving by (a) running informational and promotional campaigns; (b) setting up a matching service for origins, destinations, and times of travel; and (c) providing incentives for carpooling such as exclusive lanes on major arterial roads during rush hour.

- *Provide subscription bus services*. In areas where a large number of commuters live far from their work destination and lack public transit, subscription bus services can provide energy-efficient transportation as long as the vehicles are used to capacity. Riders are signed up in advance, with fares usually paid monthly. Locations such as park-and-ride lots are used as collection points.

- *Provide paratransit*. In small communities and in the fringe areas of large ones, municipalities can replace conventional transit with contract vans, taxis on a fixed route, and shared-ride taxi operations that work according to demand, such as dial-a-bus.

- *Provide incentives*. Park-and-ride lots, reserved lanes on freeways and arterials, and priority access to freeways during rush hours are added incentives for ridesharing that municipalities can supply. Municipalities can also introduce supportive zoning bylaws to do such things as make developers provide carpool areas, and so forth.

A Team Effort

Each municipality faces a unique transportation situation, having to meet its challenges in the ways best suited to its riders and resources. What is common to all municipalities today, however, is the need to economize. The approaches suggested in this booklet have been tested and shown to bring real dollar savings to the municipalities using them. The energy savings are substantial too. It has been estimated that a comprehensive municipal ridesharing program, for example, can reduce oil consumption by up to 5 per cent.

Information that municipalities need in order to introduce transit innovations or to begin ridesharing programs is available to them. Municipal transit departments that have done the pioneering work and employers who are sponsoring successful ridesharing programs can be consulted. The Ontario Government as well is active in giving support and technical assistance to municipalities.

For municipalities requiring more information on the measures discussed in this booklet or on any aspect of energy conservation in transportation, the Ontario Government provides the following resources:

- **Transit Service and Ridesharing**

  The detailed reports upon which this summary booklet was based are included as Chapters 3 and 4, respectively, in the **Transportation Energy Analysis Manual** (see below).

- **Transportation Energy Analysis Manual (TEAM)**

  A comprehensive summary of a wide range of conservation measures in the following areas: demand management, street-system improvements, traffic management, road construction and maintenance, fleet management, contingency planning, and municipal energy program management. Available from the Transportation Energy Management Program (TEMP).

- **The Share-A-Ride Program**

  The provincial program to promote energy saving through carpooling and vanpooling. It offers a full range of organizational and promotional materials, including pamphlets, implementation handbooks, and audio-visual materials. Share-A-Ride can be accessed through TEMP.

- The Municipal Transportation Energy Advisory Committee (MTEAC) was established to provide guidance, technical assistance, and

coordination to municipalities undertaking transportation energy conservation programs. For information, write to:

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Ministry of Transportation and Communications
1201 Wilson Avenue
Central Building — 3rd Floor
Downsview, Ontario M3M 1J8

Telephone: (416) 248-7296

- The Transportation Energy Management Program (TEMP) is a provincial program concerned with the reduction of oil dependency in the transportation sector.

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